

What is Claimed is:

1. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein after initially applying the pressing force, the pressing force is sharply increased to a predetermined value and then is gradually increased.

2. A method for vibrating, melting and bonding at least two resin parts according to claim 1, wherein the pressing force is continuously gradually increased until vibrating the contact surfaces is finished.

3. A method for vibrating, melting and bonding at least two resin parts according to claim 1, wherein the pressing force is continuously gradually increased from a predetermined value in a range not exceeding a predetermined upper limit pressing force.

4. A method for vibrating, melting and bonding at least two resin parts according to claim 2, wherein the pressing force is continuously gradually increased from the predetermined value in a range not exceeding a predetermined upper limit pressing force.

5. A method for vibrating, melting and bonding at least two resin parts according to claim 1, wherein the pressing force is continuously gradually increased by a combination of a period in which the pressing force is held at a constant value and a period in which the pressing force is increased.

6. A method for vibrating, melting and bonding at least two resin parts according to claim 2, wherein the pressing force is continuously gradually increased by a combination of a period in which the pressing force is held at a constant value and a period in which the pressing force is increased.

7. A method for vibrating, melting and bonding at least two resin parts according to claim 3, wherein the pressing force is continuously gradually increased by a combination of a period in which the pressing force is held at a constant value and a period in which the pressing force is increased.

8. A method for vibrating, melting and bonding at least two resin parts according to claim 4, wherein the pressing force is continuously gradually increased by a combination of a period in which the pressing force is held at a constant value and a period in which the pressing force is increased.

9. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein after the vibrating of the contact surfaces is started, a moving speed when the contact surfaces are vibrated is sharply increased to a predetermined upper limit and then the moving speed is gradually decreased.

10. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein the position of the first resin part of the two resin parts is measured by an amount of melting of the resin parts at the contact surfaces with reference to the second resin part of the two resin parts, a determination is made whether the amount of melting increases with a lapse of time or not, and on a basis of the determination result, a second determination is made whether a state of melting and bonding of the resin parts is good or not.

11. A method for vibrating, melting and bonding at least two resin parts according to claim 10, wherein the determination result is obtained by determining whether or not the amount of melting is within a range determined by upper

and lower limits both of which increase with the lapse of time.

12. A method for vibrating, melting and bonding at least two resin parts according to claim 10, wherein the determination result is obtained by determining whether a target amount of melting is obtained within a predetermined time or not.

13. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein a first resin part of the at least two resin parts has a projection on its outer peripheral surface, the first resin part being pressed into the holding portion of a vibrating jig to fix the vibrating jig, and the vibrating jig is vibrated in this state to vibrate the contact surfaces.

14. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein in a state where the first resin part is fixed to a vibrating jig and the second resin part is fixed to a stationary jig, the vibrating jig is vibrated to vibrate the contact surfaces, and wherein the stationary jig has receiving surfaces in accordance with a shape of the second resin part

and makes the pressing force applied to the contact surfaces uniform when the contact surfaces are vibrated.

15. A method for vibrating, melting and bonding at least two resin parts according to claim 14, wherein the receiving surfaces have a movable part to be moved according to a shape of the second resin part and is fixed in a non-movable state when contact surfaces are vibrated.

16. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein the contact surface is formed so as to make rigidity of a first resin part of the at least two resin parts nearly uniform at each portion of the contact surface.

17. A method for vibrating, melting and bonding at least two resin parts according to claim 13, wherein when the contact surface has a polygonal shape, a thickness of the resin part at a corner portion is made thinner than a thickness of the resin part at a straight portion to make rigidity of the resin part nearly uniform at each portion of the contact surface.

18. A method for vibrating, melting and bonding at least two resin parts according to claim 13, wherein in a state

where the first resin part is fixed to a vibrating jig and the second resin part is fixed to a stationary jig, the vibrating jig is vibrated to vibrate the contact surfaces, the second resin part has a polygonal rib portion whose top surface is the contact surface, and a thickness of a rib portion at its corner portion is made thinner than a thickness of the rib portion at a straight portion to make rigidity of the second resin part nearly uniform at each portion of the contact surface.

19. A method for vibrating, melting and bonding at least two resin parts by making the at least two resin parts abut against each other and vibrating their contact surfaces while applying a pressing force to them,

wherein the second resin part has a step at a contact surface and a portion, having a higher rigidity of the second resin part at the contact surface, is projected from a portion, having a lower rigidity of the second resin part at the contact surface.